

0128: TRUNNION DESIGN AND FEMORAL HEAD DIAMETER INCREASE CORROSION AT THE TAPER INTERFACE IN RETRIEVED LARGE-DIAMETER METAL-ON-METAL TOTAL HIP ARTHROPLASTY

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Aim: To characterise corrosion at the taper interface in large diameter metal-on-metal total hip arthroplasty and the effect of femoral head diameter.

Method: Corrosion was qualitatively assessed using a peer-reviewed grading system for 111 components from three different manufacturers (ASR, BHR, Durom). Unexpectedly a ridged appearance was commonly observed on the female taper surfaces, which corresponded exactly with the ridges of the trunnion surface. A new grading system was created to measure this imprinting phenomenon.

Results: 92% of the components experienced corrosion, with at least moderate corrosion seen in 61%. The manufacturer did not influence corrosion both for head components ($p=0.52$) and trunnions ($p=0.20$). A strong positive correlation ($r=0.776$, $p=0.01$) was observed between the imprinting scores and corrosion scores. Larger head diameters showed higher corrosion ($r=0.241$, $p=0.02$).

Conclusions: Corrosion affects all manufacturers and is associated with the presence of ridges on the female taper surface. It appears that the rough surface of the trunnion causes extensive mechanical damage at the female taper surface and creates a hostile corrosive environment. Femoral head diameter correlates with corrosion, which is clinically significant considering the increasing use of larger head sizes. Future work must now clarify the optimum trunnion design and femoral head diameter.

0129: WEAR AND CORROSION AT THE TAPER INTERFACE IN RETRIEVED ASR XL METAL-ON-METAL TOTAL HIP ARTHROPLASTY

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Aim: To quantify wear at the ASR XL taper interface and determine the relationship between taper corrosion and blood metal ions.

Method: Corrosion was qualitatively assessed using a peer-reviewed grading system for 52 ASR XL femoral head components. Blood metal ion levels in hips showing at least moderate corrosion was compared with those without moderate corrosion. Profilometry was performed in hips ($n=12$) that failed due to debris-induced synovitis in the presence of low bearing surface wear ($<10\mu\text{m}/\text{year}$ combined head/cup).

Results: 98% of the components were corroded, with at least moderate corrosion observed in 66%. Corrosion did not influence the levels of blood cobalt ($p=0.16$) and chromium ($p=0.12$) ions. The median volumetric loss was 3.08mm^3 (range: 0.61–9.44) and the maximum wear depth ranged from 14–85 μm .

Conclusions: Metal debris is implicated in the formation of soft-tissue reactions and we show that taper wear and corrosion is substantial. Currently there is no other culprit that could account for the higher failure rate of the ASR XL when compared to resurfacing. Greater corrosion did not equate to increased metal ion levels. Future work must determine the relative contributions of the bearing surface and taper interface to material loss and blood metal ions.

0157 WINNER OF ORTHOPAEDIC RESEARCH UK PRIZE: ACCURACY OF DIGITAL TEMPLATING IN TOTAL HIP REPLACEMENT AND POST-OPERATIVE LEG LENGTH INEQUALITY

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Aims: We aimed to determine the accuracy of digital templating at pre-dicting implant size for total hip replacement (THR) and to measure and compare pre- and post-operative leg-length inequality (LLI).

Methods: The radiographs of 70 patients undergoing THR were analysed. All radiographs were templated pre-operatively using IMPAX AGFA software. Implant size data was collected from theatre records. LLI was

determined using IMPAX software on the pre- and post-operative radiographs.

Results: Complete templating data was available for 55 patients. In 34.7% of cases the acetabular cup size was accurately predicted by pre-operative templating, with 74.5% being within $\pm 2\text{mm}$. Digital templating accurately predicted the stem size in 32.7% of cases with 65.5% being within ± 1 stem size.

Complete LLI data was available for 67 patients. The mean pre-operative LLI was 5.3 mm (range -11.9mm to +30.3mm) with the mean post-operative LLI being 7.2 mm (range -19.3mm to +25.3mm). 73.1% of patients had a post-operative LLI of $<10\text{mm}$ and 89.6% were $<15\text{mm}$.

Conclusion: Digital templating in THR is accurate to within one cup size (2mm) in 74.5% of cases and to within one stem size in 65.5% of cases. Mean post-operative LLI is less than the generally acceptable limit of 10mm.

0160: COMPARISON OF LEVELS OF PAIN PERCEIVED WHEN USING PNEUMATIC VERSUS SILICONE RING TOURNIQUETS FOR LOCAL ANAESTHETIC PROCEDURES OF THE UPPER LIMB

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Aim: To compare the level of perceived pain, and therefore tolerance, of the Silicone Ring and Pneumatic tourniquets when applied to the upper arm and to evaluate whether there was a clear benefit of use of either tourniquet in local anaesthetic procedures of the upper limb.

Materials and Methods: 30 volunteers, 15 male and 15 female, were recruited. Pain was measured using a VAS pain scale on application and at 1, 5 and 10 minutes.

Results: Volunteers experienced significantly more pain on application and at 1 and 5 minutes with the SRT. This difference in pain perceived was most marked upon application. Two volunteers could not tolerate application of the SRT. Three volunteers experienced bruising of the arm and/or forearm following use of the SRT. There was no difference in pain scores at 10 minutes.

Conclusion: Due to the severe pain experienced on application of the SRT it would not be suitable for local anaesthetic procedures in the upper limb. In addition the degree of pain may reduce the patients confidence and adversely affect their experience of the procedure. The PT is more suitable for local procedures. However the SRT may have a role in procedures performed under general anaesthetic.

0164: TRAUMA OPERATION NOTES RE-AUDIT AFTER INSTIGATION OF COMPUTER RECORDS PROGRAMME IQ UTOPIA: HOW DO COMPUTER-GENERATED OPERATION NOTES COMPLY WITH ROYAL COLLEGE OF SURGEONS OF ENGLAND'S GUIDELINES, COMPARED TO HAND-WRITTEN NOTES?

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Aim: Assess compliance of computer-documented (IQ Utopia) v hand-written operation notes, to Royal College of Surgeons of England (RCSE) recommendations (re-audit).

Method: A cross-sectional sample of computerised operation notes were examined in Wexham Park Hospital in-patients who had Orthopaedic operations ($n=40$, March 2011) and compliance was noted and compared to hand-written notes (March 2010). Fourteen categories were audited: hospital number, name, date, consultant, surgeon, procedure, incision, operative diagnosis, findings, complications, tissues removed/added/ altered, serial numbers, sutures, post-operative care and surgeon's signature.

Results: Compliance was achieved in every category with IQ Utopia. Lowest compliance was the surgeon's signature: 80%. Compared to hand-written operation notes from 2010, compliance improved in hospital number (100%), date of operation (100%), incision (97.4%), operative diagnosis (100%), findings (100%), complications (100%), details of tissue removed/added/altered (100%), sutures (100%), post-operative care (100%). Two categories worsened: serial number (95.1% to 85.3%) and signature (98.1% to 80%).

Conclusion: Using IQ Utopia resulted in compliance in all categories with the Operative Notes Guidelines as stated by the RCSE. Compliance improved in most categories except in serial number and also signature. It is likely that the implementation of a computer programme to generate operation notes was associated with this improved compliance.